

WALLES
Serial No. 09/759,645

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of processing ~~information, in particular speech~~ information, in a communication network in which pieces of speech ~~the information is~~ are transmitted ~~in pieces, in particular in packets or in slots or frames,~~ the method comprising:

~~performing making calculations according to an algorithm, the algorithm comprising a multitude of plural~~ subfunctions, each of the subfunctions having different priority and differently influencing the quality of the transmitted information with different degrees of severity or importance, wherein at each

for a given instant and, in particular for each a piece of information, calculating a measure of the total processing required at this instant is calculated and is:

compared comparing the measure of total processing required to the total processing capability for handling the transmitted information at this the given instant;
~~and that, in the case where~~

when the total processing required exceeds the total processing capability,
performing only these a subset of the plural subfunctions are performed that influence the transmitted information with a low degree of severity or a high degree of importance on a priority basis.

2. (Currently Amended) A method according to claim 1, ~~wherein at each instant preselected sub functions further comprising performing, as the subset, certain~~ subfunctions are performed which influence the transmitted information with a low degree of severity or a high degree of importance.

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3. (Currently Amended) A method according to claim 2, ~~wherein at each further~~
comprising for the given instant calculating the processing required by the preselected
subset of subfunctions is calculated; and,
determining the processing capability remaining after performing the preselected
subfunctions is determined subset; and
that performing subfunctions different from the preselected subfunctions subset
are performed according to the calculated remaining processing capability.

4. (Currently Amended) A method according to claim 1, ~~wherein further~~
comprising:
sending the information in the network is sent in a plurality of parallel channels
having different priority levels;
processing the information in each channel; being processed, and that
at each the given instant calculating the measure of the total processing required
for all of the parallel channels at this instant is calculated and;
compared comparing the total processing required for all of the parallel channels to
the total processing capability; and
that in the case where when the required processing required exceeds the total
processing capability, performing more subfunctions for channels having a high priority
level than for channels having a low priority level.

5. (Currently Amended) A method according to claim 1, ~~wherein the algorithm~~
wherein the plural subfunctions comprises an echo cancellation algorithm.

6. (Currently Amended) A method according to claim 5, wherein the echo
cancellation algorithm function is divided into ~~sub functions including at least one of the~~
following subfunctions: filtering, filter updating, double-talk detection, non-linear
processing, noise estimation, and network probing.

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7. (Currently Amended) A method according to claim 6, wherein ~~for the~~ subfunctions of filtering, non-linear processing, filter updating, double talk detection, noise estimation, and network probing, taken in this sequential order, ~~they are~~ assigned degrees of severity or importance in decreasing and increasing scales, respectively.

8. (Currently Amended) A method according to claim 4, ~~wherein at each further~~ comprising, for the given instant, always performing preselected ones of the subfunctions ~~are always performed for each channel, the preselected ones of the sub-~~ functions ~~subfunctions~~ being selected to require processing not exceeding the total processing capability.

9. (Currently Amended) A method according to claim 8, ~~wherein at each further~~ comprising performing, for the given instant, the remaining subfunctions not included in the preselected subfunctions ~~ones are performed in accordance with the total processing~~ left after performing the preselected ones of the subfunctions ~~sub functions~~.

10. (Currently Amended) A method according to claim 1, ~~wherein further~~ comprising determining the processing required by each of the subfunctions is ~~determined as the a~~ number of processor instructions used by the subfunction.

11. (Currently Amended) A method according to claim 4, ~~wherein the further~~ comprising basing a number of parallel channels in which information is sent in the communication network ~~is based on an average of the processing required for performing~~ the algorithm.

12. (Currently Amended) A method of processing ~~information, in particular~~ speech information, in a communication network in which pieces of the speech

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information is are transmitted in pieces, in particular in packets or in slots or frames, the information in the network being sent in a plurality of parallel channels having different priority levels, the method comprising:

making calculations according to an algorithm, the algorithm comprising a multitude of plural subfunctions, the information in the network being sent in a plurality of parallel channels having different priority levels, wherein at each

for a given instant, in particular and for each a piece of information, calculating a measure of the total processing required for all of the channels at this instant is calculated and is;

compared comparing the measure of total processing required for all of the channels to the total processing capability for handling the transmitted information at this the given instant and that, in the case where;

when the total processing required exceeds the total processing capability, performing more of the subfunctions for channels having a high priority level than for channels having a low priority level.

13. (Currently Amended) A method according to claim 12, wherein each of the subfunctions influence the quality of the transmitted information with different degrees of severity or importance, and when the total processing required exceeds the total processing capability, in said case, performing, for channels having a low priority level, only those of the subfunctions which influence the transmitted information with a low degree of severity or a high degree of importance.

14. (Currently Amended) A method according to claim 12, ~~wherein the algorithm~~ wherein the plural subfunctions comprises an echo cancellation algorithm.

15. (Currently Amended) A method according to claim 14, wherein the echo cancellation algorithm function is divided into ~~sub-functions including~~ at least one of the

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following subfunctions: filtering, filter updating, double-talk detection, non-linear processing, noise estimation, and network probing.

16. (Currently Amended) A method according to claim 15, wherein ~~for the~~ subfunctions of filtering, non-linear processing, filter updating, double talk detection, noise estimation, and network probing, taken in this sequential order, ~~they are~~ assigned degrees of severity or importance in decreasing and increasing scales, respectively.

17. (Currently Amended) A method according to claim 12, ~~wherein at each further~~ comprising, for the given instant, always performing preselected ones of the subfunctions ~~are always performed for each channel, the preselected ones of the sub-~~ functions ~~subfunctions~~ being selected to require processing not exceeding the total processing capability.

18. (Currently Amended) A method according to claim 17, ~~wherein at each further~~ comprising performing, for the given instant, the remaining subfunctions not included in the preselected subfunctions ~~ones are performed in accordance with the total processing~~ left after performing the preselected ones of the subfunctions.

19. (Currently Amended) A method according to claim 12, ~~wherein further~~ comprising determining the processing required by each of the subfunctions is ~~determined as the a~~ number of processor instructions used by the subfunction.

20. (Currently Amended) A method according to claim 12, ~~wherein the further~~ comprising basing a number of parallel channels in which information is sent in the communication network ~~is based on an average of the processing required for performing~~ the algorithm.

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21. (Currently Amended) A method of processing ~~information, in particular~~ speech information, in a communication network in which pieces of speech ~~the~~ information ~~is~~ are transmitted in pieces, ~~in particular~~ in packets or slots or in frames, ~~the~~ information in the network being sent in a plurality of parallel channels having different priority levels, the method ~~comprising~~ comprising:

making calculations according to an algorithm, the algorithm comprising a multitude of plural subfunctions; ~~the information in the network being sent in a plurality of parallel channels having different priority levels, wherein at each~~

for a given instant, in particular and for each a piece of information, calculating a measure of the total processing required for all of the channels at this instant is calculated and is;

compared comparing measure of total processing required for all of the channels to the total processing capability for handling the transmitted information at this the given instant and that, in the case where;

when the total processing required exceeds the total processing capability, performing some of the subfunctions for the channels in accordance with a round robin scheme.

22. (Currently Amended) A method according to claim 21, ~~wherein the algorithm~~ wherein the plural subfunctions comprises an echo cancellation algorithm.

23. (Currently Amended) A method according to claim 22, wherein the echo cancellation algorithm function is divided into ~~sub-functions including at least one of the~~ following subfunctions: filtering, filter updating, double-talk detection, non-linear processing, noise estimation, and network probing.

24. (Currently Amended) A method according to claim 23, wherein ~~for the~~ subfunctions of filtering, non-linear processing, filter updating, double talk detection,

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noise estimation, and network probing, taken in this sequential order, ~~they~~ are assigned degrees of severity or importance in decreasing and increasing scales, respectively.

25. (Currently Amended) A method according to claim 21, ~~wherein at each further~~ comprising, for the given instant, always performing preselected ones of the subfunctions ~~are always performed for each channel, the preselected ones of the sub-~~ functions ~~subfunctions~~ being selected to require processing not exceeding the total processing capability.

26. (Currently Amended) A method according to claim 25, ~~wherein at each further~~ comprising performing, for the given instant, the remaining subfunctions not included in the preselected subfunctions ~~ones are performed in~~ accordance with the total processing left after performing the preselected ones of the subfunctions.

27. (Currently Amended) A method according to claim 21, ~~wherein further~~ comprising determining the processing required by each of the subfunctions is ~~determined as the~~ a number of processor instructions used by the subfunction.

28. (Currently Amended) A method according to claim 27, ~~wherein the further~~ comprising basing a number of parallel channels in which information is sent in the communication network ~~is based on an average of the processing required for performing~~ the algorithm.

29. (Currently Amended) A processor for processing ~~information, in particular~~ speech information, sent as pieces of transmitted information in a communication network, ~~the processor processing the information is transmitted in pieces, in particular in~~ packets or in slots or frames, the processor comprising comprising:

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calculating means for making calculations according to an algorithm comprising a ~~multitude of plural~~ subfunctions, the calculation means comprising calculation modules, each calculation module adapted to perform an individual one of the subfunctions, each of the subfunctions having different priority and differently influencing the quality of the transmitted information sent with different degrees of severity or importance, the processor further comprising:

control means for determining, at ~~each a given instant and, in particular for each a~~ piece of information, a measure of the total processing by the processor required ~~at this instant and for comparing the measure to the total processing capability of the processor for handling the transmitted information,~~ and for selecting, in the case where the total processing required exceeds the total processing capability, ~~only these calculation modules which perform subfunctions that influence the transmitted information with a low degree of severity or a high degree of importance, the calculation modules not selected being inactive at this the given instant, and thereby not performing their subfunctions.~~

30. (Currently Amended) A processor according to claim ~~15~~²⁹, wherein the control means are arranged to select ~~at each~~ for the given instant only calculation modules performing preselected ones of the subfunctions, the preselected ones ~~influence~~ influencing the transmitted information with a low degree of severity or a high degree of importance.

31. (Currently Amended) A processor according to claim 30, wherein the control means are arranged to calculate ~~at each~~ for the given instant the processing required by the preselected subfunctions and to determine the processing capability of the processor remaining after performing the preselected subfunctions and to activate calculation modules performing subfunctions ~~different~~ differing from the preselected subfunctions, the activation being made according to the calculated remaining processing capability.

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32. (Currently Amended) A processor according to ~~any of claims 29, for the case where wherein when~~ the information in the network is sent in a plurality of parallel channels having different priority levels, wherein the processor is arranged to process the information in each of the channels and to calculate ~~at each for the given instant~~ the measure of the total processing required for all of the parallel channels ~~at this instant and~~ comparing the measure, and ~~in the case where when~~ the measure of the required processing required is found to exceed the total processing capability, to activate more calculating modules performing subfunctions for information sent in channels having a high priority level than for information sent in channels having a low priority level.

33. (Original) A processor according to claim 29, wherein the calculation means are arranged to perform an echo cancellation algorithm.

34. (Original) A processor according to claim 33, wherein the calculating modules are arranged to perform subfunctions of the echo cancellation algorithm function including at least one of: filtering, filter updating, double-talk detection, non-linear processing, noise estimation, and network probing.

35. (Currently Amended) A processor according to claim 34, wherein the subfunctions of filtering, non-linear processing, filter updating, double talk detection, noise estimation, and network probing, taken in this sequential order, are assigned degrees of severity or importance in decreasing and increasing scales, respectively.

36. (Currently Amended) A processor according to claim 32, wherein the control means are arranged to ~~always activate at each for the given instant~~ calculating modules performing preselected ones of the subfunctions for all of the channels, the preselected

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ones of the sub-functions being selected to require processing not exceeding the total processing capability.

37. (Currently Amended) A processor according to claim 36, wherein the control means are arranged to activate at each for the given instant the calculating modules performing the remaining subfunctions not included in the preselected ones in accordance with the total processing left after performing the preselected ones of the subfunctions.

38. (Original) A processor according to claim 29, wherein the control means are arranged to determine the processing required by the calculating modules for performing each of the subfunctions as the number of processor instructions used by the subfunction.

39. (Original) A processor according to claim 32, wherein the processor is arranged to handle a number of parallel channels in which information is sent in the communication network, the number being based on an average of the processing required for performing the algorithm.

40. (Currently Amended) A processor for processing information, ~~in particular speech information, sent as pieces of transmitted information in packets or slots or frames in a communication network in which the information is transmitted in pieces, in particular in packets or in frames,~~ the information in the network being sent in a plurality of parallel channels having different priority levels, the processor ~~comprising comprising:~~ calculating means for making calculations according to an algorithm comprising a ~~multitude of plural subfunctions of differing priority and differing subfunctionality,~~ the calculation means comprising calculation modules, each calculation module adapted to perform an individual one of the subfunctions, ~~the processor further comprising:~~ control means for determining, at each for a given instant, in particular and for each a piece of information, a measure of the total processing by the processor required

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for all of the channels at ~~this the given~~ instant and for comparing the measure to the total processing capability of the processor for handling the transmitted information, and for activating, ~~in the case where~~ when the total processing required exceeds the total processing capability, more calculating modules performing subfunctions for information sent in channels having a high priority level than for information sent in channels having a low priority level.

41. (Currently Amended) A processor according to claim 40, wherein the calculating modules are arranged to perform subfunctions which influence ~~the quality of~~ the information sent with ~~different~~ differing degrees of severity or importance, and that the control means are arranged to activate ~~in said case, when the total processing required exceeds the total processing capability~~, for channels having a low priority level, only those of the calculating modules which perform subfunctions that influence the information sent with a low degree of severity or a high degree of importance.

42. (Original) A processor according to claim 40, wherein the calculation means are arranged to perform an echo cancellation algorithm.

43. (Original) A processor according to claim 42, wherein the calculating modules are arranged to perform subfunctions of the echo cancellation algorithm function including at least one of: filtering, filter updating, double-talk detection, non-linear processing, noise estimation, and network probing.

44. (Currently Amended) A processor according to claim 43, wherein the subfunctions of filtering, non-linear processing, filter updating, double talk detection, noise estimation, and network probing, taken in this sequential order, are assigned degrees of severity or importance in decreasing and increasing scales, respectively.

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45. (Currently Amended) A processor according to claim 40, wherein the control means are arranged to ~~always activate at each for the given~~ instant calculating modules performing preselected ones of the subfunctions for all of the channels, the preselected ones of the sub-functions being selected to require processing not exceeding the total processing capability.

46. (Currently Amended) A processor according to claim 45, wherein the control means are arranged to activate ~~at each for the given~~ instant the calculating modules performing the remaining subfunctions not included in the preselected ones in accordance with the total processing left after performing the preselected ones of the subfunctions.

47. (Original) A processor according to claim 40, wherein the control means are arranged to determine the processing required by the calculating modules for performing each of the subfunctions as the number of processor instructions used by the subfunction.

48. (Original) A processor according to claim 40, wherein the processor is arranged to handle a number of parallel channels in which information is sent in the communication network, the number being based on an average of the processing required for performing the algorithm.

49. (Currently Amended) A processor for processing ~~information, in particular speech information, sent as pieces of speech information in packets or slots or frames in a communication network in which the information is transmitted in pieces, in particular in packets or in frames,~~ the information in the network being sent in a plurality of parallel channels having different priority levels, the processor ~~comprising comprising:~~ calculating means for making calculations according to an algorithm comprising a ~~multitude of plural~~ subfunctions of differing priority and differing subfunctionality, the

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calculation means comprising calculation modules, each calculation module adapted to perform an individual one of the subfunctions, ~~the processor further comprising;~~

control means for determining, at ~~each a given instant, in particular~~ and for each a piece of information, a measure of ~~the total processing by the processor required for all of the channels at this the given instant~~ and for comparing the measure to ~~the total~~ processing capability of the processor for handling the transmitted information, and for activating, ~~in the case where when~~ the total processing required is found to exceed the total processing capability, some of the calculating modules performing subfunctions for the channels in accordance with a round robin scheme for the channels.

50. (Original) A processor according to claim 49, wherein the calculation means are arranged to perform an echo cancellation algorithm.

51. (Currently Amended) A processor according to claim 50, wherein the calculating modules are arranged to perform subfunctions of the echo cancellation algorithm function including at least one of: filtering, filter updating, double-talk detection, non-linear processing, noise estimation, and ~~10~~ network probing.

52. (Currently Amended) A processor according to claim 51, wherein the subfunctions of filtering, non-linear processing, filter updating, double talk detection, noise estimation, and network probing, taken in this sequential order, are assigned degrees of severity or importance in decreasing and increasing scales, respectively.

53. (Currently Amended) A processor according to claim 49, wherein the control means are arranged to ~~always activate at each~~ for the given instant calculating modules performing preselected ones of the subfunctions for all of the channels, the preselected ones of the sub-functions being selected to require processing not exceeding the total processing capability.

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54. (Currently Amended) A processor according to claim 53, wherein the control means are arranged to activate for the given at each instant the calculating modules performing the remaining subfunctions not included in the preselected ones in accordance with the total processing left after performing the preselected ones of the sub functions.

55. (Original) A processor according to claims 49, wherein the control means are arranged to determine the processing required by the calculating modules for performing each of the subfunctions as the number of processor instructions used by the subfunction.

56. (Original) A processor according to claim 49, wherein the processor is arranged to handle a number of parallel channels in which information is sent in the communication network, the number being based on an average of the processing required for performing the algorithm.

57. (New) An echo canceller which receives pieces of speech information transmitted as packets or slots or frames, the echo canceller comprising a processor which is configured to make a determination whether an amount of processing required at a given instant for performing echo cancellation exceeds a total processing capability of the processor for handling echo cancellation and, in dependence on the determination, to execute a subset of plural potential echo cancellation subfunctions, with each of the subfunctions having differing subfunctionality and differently influencing the echo cancellation.

58. (New) The echo canceller of claim 57, wherein the plural potential echo cancellation subfunctions include at least one of: filtering, filter updating, double-talk detection, non-linear processing, noise estimation, and network probing.

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59. (New) The echo canceller of claim 58, wherein the plural potential echo cancellation subfunctions are prioritized in the following order: filtering, non-linear processing, filter updating, double talk detection, noise estimation, and network probing.

60. (New) An executable program stored in a memory which, when executed by a processor, performs steps of:

making a determination whether an amount of processing required at a given instant for performing speech signal processing exceeds a total processing capability of the processor for handling the speech signal processing;

in accordance with the determination, invoking a subset of potential plural speech signal processing subfunctions, with each of the subfunctions having differing subfunctionality and differently influencing the speech signal processing, thereby determining a number of speech signal processing subfunctions to be allocated to a speech signal processing task in accordance with load on the processor.

61. (New) The executable program of claim 60, wherein the speech signal processing is echo cancellation or transcoding.